

		ENTERPRISE EXCELLENCE TECHNICAL OPERATION PROCEDURE		
PROCEDURE NUMBER: 5-6-EW-NO-PED-00001	REV: 04	PAGE: 1 of 2	ORIGINAL ISSUE DATE: 09/11/2009	REVISION DATE: 05/04/2010
PREPARED BY: O BORE / M WYNOT	REVIEWED BY: O BORE / C MANN		APPROVED BY: C EVANS	APPROVED BY: RIENK REITSMA
TITLE:	HJ DRILLING JAR – DOUBLE ACTING HYDRAULIC DRILLING JAR			

HJ DRILLING JAR - Double Acting Hydraulic Drilling Jar

The HJ Jar is a Double Acting Hydraulic Drilling Jar complete with a Mechanical lock mechanism, and has been designed, and manufactured to comply with all current specifications. The Hydraulic metering system is not dependent on fluid viscosity delay times over the full operating temperature range. The HJ is run in its normal locked position where it is capable of immediate jarring in either direction. Fast resetting is achieved by re-engaging the lock to allow continuous jarring either up, or down.

JAR LOCK	TOOL SIZE			
Settings (in/mm)	4.750 120.65	6.625 168.275	8.000 203.2	9.625 244.475
Up (lbf)	25,000 – 35,000 lb	60,000 – 80,000 lb	80,000 -100,000 lb	80,000 -100,000 lb
Up (t)	11.35 – 15.89	27.24 – 36.3	36.3 – 45.4	36.3 – 45.4
Down (lbf)	12,000 – 20,000 lb	25,000 – 35,000 lb	30,000 – 45,000 lb	30,000 – 45,000 lb
Down (t)	5.48 – 9.08	11.35 – 15.89	13.62 – 20.463	13.62 – 20.463
1 Pound = 0,454 kilogram / (t) = metric value / 1 tonne = 1,000 kilogram) The lock mechanism in the HJ Jar will prevent accidental firing during normal operations and removes the requirements for a "Safety clamp"				

OPERATION INSTRUCTIONS

- Jarring Up**
Jarring up is achieved by applying an overpull at the jar sufficient to overcome the lock setting and then continuing to apply loading until desired overpull is reached. The hydraulic metering will then control release. Set down sufficient load to close the jar, re-engage the lock and then repeat as necessary.
Note: The set down load to re-cock/re-lock the jar must remain below the minimum lock setting down as exceeding will release the lock downward.
- Jarring Down**
Jarring down is achieved by applying a set down load at the jar sufficient to overcome the lock setting and then continuing to apply loading until the desired load is reached. The hydraulic metering will then control release. Pick up sufficient load to open the jar, reengage the lock and then repeat as necessary.
Note: The pick up load to re-cock/re-lock the jar must remain below the minimum lock setting up as exceeding will release the lock upward.
- Pump Open Force**
The pump pressure creates a reaction force called the pump open force (POF) within the tool which tries to force the tool open. To calculate this pump open force, multiply the pump open area (POA) times the pressure drop across the bit.
- MA Impact Enhancer**
When used in conjunction with the HJ Drilling Jar, the Impact enhancer will increase the acceleration of the hammer mass thereby providing greater attainable impacts. The double acting operation of the tool will also work to minimize the shock loads on the working string and surface equipment. The Impact enhancer is highly effective when utilized in shallow hole sections as well as highly deviated wells.

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- Mechanical Lock Mechanism*

To prevent unintentional firing, and to ensure that the lock is engaged after pulling out of the hole, the gap on mandrel in locked position should match the value in the table below. If the value does not match, and are greater than this, Lock the jar in the slips (Underneath the mandrel), and carefully apply weight to the jar until the gap reaches the recorded value. Exceeding “**lock setting down**” will release the lock downwards. If this happens, the jar has to be pulled back into locked position to prevent the jar from firing when racked. **Refer to the table below for the proper gap setting.**

HYDRAULIC JAR SPECIFICATIONS					
Outside Diameter (in/mm)	3.375 85.725	4.750 120.65	6.625 168.275	8.000 203.2	9.625 244.475
Inner Diameter (in/mm)	1.375 34.92	2.250 57.15	2.520 64.00	2.813 71.45	3.000 76.2
¹ Tensile Yield (lbf/kN)	164,214 730	439,796 1,956	745,094 3,314	899,762 4,002	1,658,427 7,377
Max Pre-Jarring Pull (lbf/kN)	45,000 200	100,000 445	180,000 801	295,000 1,312	410,000 1,824
Torsional Yield (lb-ft/kN-m)	6,840 9.3	12,518 17.0	45,980 62.3	77,831 105.5	140,415 190.4
² Max Temperature (°C / °F) (standard / high temperature)	110 / 230 (200 / 392)	110 / 230 (200 / 392)	110 / 230 (200 / 392)	110 / 230 (200 / 392)	110 / 230 (200 / 392)
Overall Jar Stroke (in/mm)	21 533.4	18 457.2	18 457.2	18 457.2	18 457.2
POA (in ² /cm ²)	5.4 34.84	11.0 70.972	16.8 108.39	28.3 182.59	35.8 230.98
Tool Length (ft/m)	16 4.9	20 6.1	20 6.1	20 6.1	20 6.1
Tool Length c/w Top Sub Sizes (ft/m)	31 9.4	31 9.4	31 9.4	31 9.4	31 9.4
Weight (lb/kg)	550 249	1,000 454	1,950 885	3,000 1361	4,150 1882
Weight c/w Top Sub (lb/kg)	800 363	1,500 680	3,000 1301	4,500 2041	6,500 2948
Standard Connections	2 3/8 IF	NC 38	NC 50	6 5/8 Reg	7 5/8 Reg
³ Gap on Mandrel in Locked Position (in/mm)	11.42 290	11.53 292.9	11.48 291.6	11.43 290.4	12.28 312

¹ Tensile and torsional yield values are calculated per API RP7G, based on nominal dimensions and the published yield strength of the material and do not constitute a guarantee, actual or implied.

²The maximum temperature is available upon request only.

³The distance between the splined mandrel shoulder (Top of Radius -SRG side) and the facing splined housing shoulder